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INTERMARRIAGE AND THE LIFECYCLE TIMING OF MIGRATION

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Intermarriage is a key indicator of immigrant integration because intimate partner choices presume the absence of prejudice between ethno-racial groups (Alba and Nee 2003; Gordon 1964; Waters and Gerstein Pineau 2015: Chapter 8) and because a substantial body of research identifies barriers to boundary crossing in unions involving immigrants (see recent reviews by Rodriguez-Garcia 2015; Waters and Gerstein Pineau 2015). A growing body of evidence shows that in addition to birthplace, age at migration is an important correlate of immigrant integration (e.g., Beck et al. 2012; Bleakley and Chin 2008; Clarke 2016; Goldberg et al. 2016; Myers et al. 2009). Yet, to date, only one study considers how the lifecycle timing of migration is associated with partner choice (Qian et al. 2012). This oversight reflects the longstanding practice of studying integration using measures of exposure (i.e., length of residence) or generation (Waters and Gerstein Pineau 2015) as well as the limited number of data sources with large immigrant samples that also record age at marriage.

How age at migration influences mate selection is an empirical question because the migration literature and life course paradigm offer competing predictions. The migration literature conceptualizes the relationship between age at migration and intermarriage as a *linear* function, one consistent with straight-line assimilation (Alba and Nee 1997 2003). Simply stated, younger arrivals experience longer exposure to US norms and institutions, which allow them to adapt culturally and socially as they interact with members of other racial and ethnic groups. This implies a monotonic association between migration age and the odds of intermarriage. Elder's (1998) life course paradigm and the child development literature provide an alternate perspective, positing that the consequences of life transitions are highly contingent on the age they occur. Two critical periods—childhood and adolescence—are at the forefront of this theoretical framework. Childhood is marked by neurobiological changes facilitating language acquisition; thus, child migrants are better equipped to acquire native level proficiency in English, which in turn facilitates their integration to the host society (Clarke 2016; Chinn and Bleakley 2008). Adolescence is

¹⁰Appendix Table S4 presents each individual coefficient and its statistical significance.

¹¹For ease of presentation, we do not present mathematical equations beyond this point.

¹²Appendix Table S5 presents each individual coefficient and its statistical significance.

SUPPORTING INFORMATION

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pivotal developmental period characterized by myriad physical and neurological changes, identity crystallization, and changes in emotional attachments and relationships with peers (Carver et al. 2003; Goldberg et al. 2016). Immigrant youth who recently arrived in the host country are no different from other youth in this regard, but they are subject to additional challenges depending on their regional origins and especially if they lack proficiency in the host country language (Myers 1999; Rumbaut 2004; South et al. 2005; Goldberg et al. 2016). Insights from the life course paradigm suggest the testable hypothesis that intermarriage rates will be highest among child migrants and lowest among adolescent migrants.

There is scant information about the association between age at migration and partner selection because of data limitations (e.g., exclusion of year of marriage from the Census). Consequently, to exclude marriages formed abroad, researchers interested in immigrant intermarriage restricted analytic samples to immigrants who arrived in the United States before they were 20 years old. Qian et al. (2012), for example, show that child migrants intermarry at higher rates compared with adolescent migrants, but whether this implies an inverse linear association between age at migration and propensity to intermarry is unclear. On the one hand, their findings align with the premises of the straight-line assimilation paradigm in that earlier exposure to American norms and institutions results in higher intermarriage rates (Gans 1997; Gordon 1964). On the other hand, their findings support developmental psychologists' claims that moves during childhood are conducive to successful integration, whereas moves during adolescence—both internal and international—pose unique integration challenges that carry over into partnering behavior (Beck et al. 2012; Myers 1999; South et al. 2005).

That contemporary immigrant integration occurs in multi-ethnic contexts also has implications for the association between age at migration and intermarriage because the rapid diversification of the US population since 1970 has broadened the range of ethno-racial boundaries that can be crossed in marriage (Qian and Lichter 2007; Qian et al., 2012). Considering group differences in opportunities and constraints for intermarriage, we expect variations in both the rigidity of distinct boundaries and according to the lifecycle timing of migration (Choi and Tienda 2016; Waters and Gerstein Pineau 2015). For example, boundaries involving Hispanics are less rigid than those involving only non-Hispanics because racial identities are less sharply defined in Latin America (Telles and Sue 2009). Moreover, the influx of male migrants from Latin America replenishes the pool of potential co-ethnic spouses for Hispanic women, which implies lower intermarriage rates among Hispanic women who immigrated as adults because they have more in common with recent migrants relative to those who arrived at younger ages. By contrast, due to the legacy of anti-miscegenation laws in the United States, boundaries involving Blacks (especially those between Whites and Blacks) remain more rigid than those between non-Black groups (Bany et al. 2014; Lee 2015). Personal traits that facilitate intermarriages (e.g., high levels of education) do not appear to soften the rigidity of the White-Black boundary (Choi and Tienda 2016). Whether younger arrival ages and exposure to English before the critical period of language acquisition increase immigrants' propensity to cross the White-Black boundary is an empirical question that needs to be addressed.

Using data from the 2008–2015 American Community Survey, we document the relative permeability of ethno-racial boundaries between natives and immigrants who arrived at different stages of their lifecycle. To do so, we first assess the extent to which birthplace and education facilitate crossing pan-ethnic boundaries in partner selection. We then adjudicate between the competing hypotheses about the relationship between age at migration and intermarriage. Specifically, we identify the boundaries for which intermarriage diminishes monotonically with increasing age at migration and those for which intermarriage rates are highest for child migrants and lowest for adolescent migrants. Because of established gender differences in propensity to form exogamous unions (Wang et al. 2012), we also investigate whether intermarriage patterns by age at migration differs for men and women.

Following a brief overview of the theoretical underpinnings of sorting behavior that highlights the significance of age at arrival for immigrant integration, we describe the analytical sample, key operational measures, and modeling approach. The empirical analysis, which begins with descriptive tabulations characterizing intermarriage rates across ethno-racial, nativity and gender groups, focuses on results from log-linear analyses that characterize variations in the permeability of boundaries. The concluding section summarizes key findings, study limitations and future research directions. Throughout, we use the term *intermarriage* and *exogamy* to refer to marriages involving spouses from distinct pan-ethnic groups; *same race unions* and *endogamy* to refer to marriages involving spouses from the same pan-ethnic group. *Child migrants* are immigrants that arrived in the host country before age 12; *adolescent migrants* arrived between ages 12 and 17; and *adult migrants* arrived at ages 18 or higher.¹

THEORETICAL CONSIDERATIONS

Intermarriage as Immigrant Integration

Assimilation theory remains the dominant paradigm for understanding immigrants' marital sorting (Alba and Nee 2003; Schwartz 2013). Classic assimilation theory predicts that acculturation and structural integration into host country institutions reduces the salience of ethno-racial markers in secondary and primary relationships (Schwartz 2013; Waters and Gerstein Pineau 2015). Thus, intermarriages rates, especially those involving immigrant minorities and native-born Whites, will increase as the foreign-born assimilate into US culture and society (Waters and Gerstein Pineau 2015). Critics argue that Milton Gordon's formulation of assimilation—the Anglo Conformity model in particular—oversimplifies contemporary partnering behavior by assuming that intermarriage patterns necessarily involves White partners and that exogamous sorting evolves uniformly for all groups even as the host society becomes more diverse (Fu 2001; Harris and Ono 2005; Lichter et al. 2007). In a powerful critique of straight-line assimilation, Gans (1997) argued that ethnic maintenance persists even if minority immigrants adapt culturally because prejudice and discrimination can thwart their socioeconomic and spatial integration, and, in turn, restrict opportunities for inter-group relations.

¹The operational definitions for child and adolescent migrants are grounded in prior research about the implications of age at migration for socioeconomic mobility (Beck et al. 2012; Bleakley and Chin 2010).

Conceding that neither group experiences nor their impacts on receiving communities are symmetrical over time and place, Alba and Nee (1997) make three important analytical distinctions that are germane for the study of intermarriage, namely *boundary crossing*, *blurring boundaries*, and *shifting boundaries*. These theoretical distinctions underscore the importance of understanding how social distances among ethno-racial groups change beyond average distances vis-à-vis the White majority. Simply put, intermarriage is a prototypical form of boundary crossing—one that many studies eschew by focusing on specific pairings (e.g., Black-White or Hispanic-White unions) or aggregating ethno-racial groups as an undifferentiated minority (Min and Kim 2009; Qian et al. 2012). In the context of rapid diversification (Frey 2015), understanding how immigration influences mate selection requires attention to the *relative* permeability of a diverse array of ethno-racial boundaries, not only those involving Whites.

The relative permeability of a specific ethno-racial boundary depends not only cultural affinities, but also on the perceived social desirability of ethno-racial groups (Herman and Campbell 2012; Wang et al. 2012). There is consensus in the intermarriage literature that Whites are the most desirable and Blacks are the least desirable outgroup partners (Bany et al. 2014; Blackwell and Lichter 2000; Wang 2012). In further support of this claim are findings showing that (1) boundaries involving Black mates are more rigid compared with those involving non-Blacks and (2) boundaries involving White spouses tend to be more permeable than those involving two ethno-racial groups (Choi and Tienda 2016; Lee 2015).

Age at Migration and Boundary Crossing in Marriage

A growing body of empirical evidence shows that age at migration is an important correlate of immigrants' integration, as evident in English language acquisition (Bleakley and Chin 2010; Oropesa and Landale 1997), educational attainment (Beck et al. 2012; Clarke 2016; Corak 2012; Bleakley and Chin 2008; Gonzalez 2003; Lee and Edmonston 2011; Rumbaut 2004), sexual initiation (Goldberg et al. 2016), and birth outcomes (Adsera et al 2012; Teitler et al 2012). With few exceptions, the intermarriage literature largely overlooks how the lifecycle timing of migration is associated with marital sorting behavior.

Although seemingly straightforward, the underlying association between age at migration and intermarriage is ambiguous because it captures both age-sensitive mechanisms that are linked to sorting behavior, such as language acquisition (Knudsen et al. 2006) and identity formation (McLanahan 2004; Phinney 1990; South et al. 2005), as well as mechanisms shaped by immigrants' relative exposure to the cultural institutions and norms of sending and receiving societies (Rumbaut 2004). Reflecting this complexity, the migration literature and life course paradigm offer competing hypotheses about the relationship between age at migration and intermarriage. The migration literature predicts a *linear* association between age at migration and intermarriage rates. Early and prolonged exposure to American norms and institutions foster worldviews and tastes that are similar to those of US natives (Beck et al. 2012; Bleakley and Chin 2010) and also shift primary reference groups away from origin to host country friends (Rumbaut 2004). Assuming that acculturation varies directly with exposure to host country norms (so-called "duration" effects), the straight-line variant of assimilation theory implies that older age at arrival is associated with lower propensity to

intermarry (Alba and Nee 2003; Myers et al. 2009). Duration effects, however, conflate exposure to host society institutions with age at migration, which captures *both* the extent of socialization into US norms *and* the timing of migration-linked disruptions.

By contrast, the life course paradigm posits that the challenges of integration depend on the ages at which moves occur (Elder 1998; Myers 1999; Goldberg et al. 2016). Two developmental stages are particularly relevant for understanding links between the lifecycle timing of migration and coupling behavior. One is the “critical period of language acquisition”, which is the developmental stage centering around ages 8 and 11 when individuals are most responsive to linguistic stimuli (Bleakly and Chin 2008, 2010; Clarke 2016; Knudsen et al. 2006; Beck et al. 2012). Immigrants who move after this period typically have limited English proficiency as adults relative to their peers who migrate at earlier ages, which can dampen prospects for socioeconomic integration, relegate them to educational and occupational statuses with little opportunity to interact with members of other groups, and diminish their attractiveness as potential partners (e.g., Beck et al. 2012; Bleakley and Chin 2010; Corak 2012; Duncan and Trejo 2007; Meng and Gregory 2005).

Adolescence is the other sensitive period for understanding marital sorting behavior. Developmental psychologists characterize adolescence as a tumultuous period that involves several milestones, including identity formation, emotional separation from parents, strengthening of peer networks and formation of emotional bonds—all while making choices that impact their long-term socioeconomic futures (Goldberg et al., 2016; Larson and Haam 1992; Myers 1999; Phinney 1990; South et al. 2005). International moves compound the developmental challenges of adolescence by disrupting peer networks and requiring adjustment to new school settings, often without the requisite language skills and for some teens, also under conditions of reduced parent supervision (Anderson et al. 2014; Harris et al., 2002; South et al. 2005). Geographic mobility during adolescence has been linked with school disengagement (Rumberger and Larson 1998; Myers 1999), low school performance (Teachman et al. 1996), high rates of delinquency and substance abuse (Hoffmann and Johnson 1998), and early sexual initiation (Goldberg et al. 2016; Harris et al. 2002; South et al. 2005). Not only do these unfavorable socioeconomic outcomes diminish the desirability of adolescent migrants as intimate partners, but they may also restrict educational, occupational, and residential opportunities to interact with natives as social equals. The testable implication is that child migrants will be more likely and adolescent migrants will be less likely than adult migrants to intermarry.

A recent study by Qian and colleagues (2012), which shows that older age at arrival is associated with a decline in odds of intermarriage for Mexicans, Filipinos, Chinese, and Puerto Ricans – offers a rare contribution to the sparse literature on the relationship between age at migration and intermarriage. Nevertheless, the study’s external validity is somewhat limited because the foreign-born sample is restricted to immigrants who arrived in the United States before they turned 20 years of age in order to exclude marriages occurring abroad. This form of right censoring prevented the authors from ascertaining whether (1) older age at arrival is associated with higher intermarriage rates or (2) geographic moves during childhood facilitate integration whereas those during adolescence pose unique integration challenges via mate selection. Finally, the authors’ aggregation of minority

pairings into a residual group limits insights about whether and how the relative permeability of specific ethno-racial boundaries differs according to the lifecycle timing of migration.

Gender, Lifecycle timing of Migration, and Intermarriage

Gender asymmetries in intermarriage patterns are well established; however, except for Qian et al. (2012), the intermarriage literature about gender differences in the relationship between age at migration and intermarriage is sparse.² The migration and youth development literatures provide theoretical guidance for understanding gender differences in the age-at-migration intermarriage gradient by focusing on variations in: (1) the social desirability as outgroup partners (Kalmijn 1998) and (2) marriage market conditions (Harris and Ono 2005).

There is abundant evidence that the social desirability of Blacks and Asians as potential partners differs for men and women. Black men's intermarriage rates are double those of Black women, but Asian men's intermarriage rates are half those of Asian women (Wang et al. 2012). This implies that relative to co-ethnics of the opposite gender, Black women and Asian men are less attractive partners to out groups (Balistreri et al. 2015; Collins 2004). Attitudinal studies also report that Black men are frequently viewed as athletic and virile whereas Black women are considered unfeminine and aggressive; by contrast, Asian men are often portrayed as effeminate and lacking sexual appeal whereas Asian women are deemed feminine and physically attractive (Balistreri et al. 2015; Bany et al. 2014). Greater structural integration in American institutions improves the intermarriage prospects of Asian women and Black men to a greater extent than they do those of their co-ethnic counterparts of the opposite sex whose lower attractiveness as mates constrains boundary crossing in marriage. This implies that the age-at-migration gradient of intermarriage will be less pronounced for Asian men and Black women relative to their peers of the opposite gender.

The sex composition of migration flows is another mechanism contributing to gender asymmetries in the relationship between age at migration and intermarriage patterns (Choi and Tienda 2015). That men are overrepresented in the massive migration flows from Latin America (Ruiz et al. 2015) implies a continuous replenishment of potential co-ethnic partners for Hispanic women (Lichter et al. 2007). Adult female migrants who spent most of their formative years abroad presumably will be most inclined to take advantage of replenished co-ethnic partner pools to actualize their preferences for endogamy. Arguably, these differences have implications for *both* the size of the intermarriage rate differential between Hispanic immigrant women who migrated as adults and those who migrated at younger ages as well as gender asymmetries in the pattern of variation in Hispanic intermarriage rates by age at migration.

To address whether and how the lifecycle timing of migration is associated intermarriage, we empirically examine how the permeability of specific ethno-racial boundaries varies

²Qian and colleagues (2012) show the age-at-migration gradient for intermarriage is more pronounced for Chinese men than for their female counterparts, but the opposite pattern obtains for Mexicans and Puerto Ricans. Gender asymmetry in the relationship between age at migration and intermarriage patterns was not the focus of this study; hence the study provides limited discussion about *why* these patterns emerge. Because this study focused on specific immigrant groups (i.e., Mexican, Puerto Rican, Filipino, and Chinese), it provides no information on gender differences in the odds of crossing pan-ethnic boundaries.

according to nativity status, age at migration, and gender. Building on the insights synthesized from the migration and the child development literatures, we expect:

- ***Competing Hypothesis 1A:*** Earlier socialization in the host country and better English proficiency promotes intermarriage; therefore, intermarriage will decrease monotonically with rising age at migration.
- ***Competing Hypothesis 1B:*** Migrating prior to the critical period of language acquisition facilitates intermarriage, therefore, intermarriage rates will be highest among child migrants. By contrast, migration-related disruptions compound to the challenges associated with reaching developmental milestones during adolescence; therefore, intermarriage rates will be lowest among adolescent migrants.
- ***Hypothesis 2:*** Whether the pattern of variation in intermarriage odds by age at migration follows the pattern predicted by *Hypothesis 1A* or *Hypothesis 1B* will depend on the *specific* boundary being crossed.
- ***Hypothesis 3:*** Given gender asymmetries in social desirability as outgroup partners and marriage market constraints, the relationship between age at migration and odds of crossing a specific boundary will differ for men and women.

DATA AND METHODS

We use data from the 2008–2015 American Community Surveys (ACS), which collected information about social and demographic characteristics, the relationship of household members, year of immigration, year of marriage, and number of times married. The ACS data are especially well suited to study mate selection behavior for several reasons. First, ACS asks respondents to report their own ethnic and racial identity as well as that of other household members. Combined with the spousal locator, we can assess the ethnic and racial resemblance between co-resident spouses. Second, the ACS collects information about year of arrival to the United States, which allows ascertaining age at migration for respondents born abroad. Third, starting in 2008, ACS asked respondents to report their year of marriage, which when combined with data on year of arrival to the United States, permits identification and exclusion of marriages formed abroad. Pooling annual micro-data from the 2008–2015 ACS yields a sufficient sample of intermarriages to permit disaggregation according to nativity status (or age at migration), education, and pan-ethnic membership of both spouses.

3.1. Sample

Our analytical sample consists of first marriages formed in the United States within 12 months of the ACS interview date by non-Hispanic (NH) White, NH Black, Hispanic, and NH Asian men and women. Limiting the sample to *new marriages* imparts two advantages: first, it minimizes period heterogeneity in attitudes and tolerance toward intermarriage; and second, it reduces biases resulting from unequal dissolution rates between endogamous and exogamous unions.³ We exclude unions involving Native American spouses because all are

US-born and also those involving NH “Some Other Race” spouses because it is impossible to ascertain whether marriages between two spouses who identify as NH “Some Other Race” represent interracial or endogamous unions. Finally, we exclude new marriages with foreign-born spouses who report a migration year that precedes their birth year, and to ensure that the observed mate selection behavior captures differences in the degree of integration of immigrants who arrived in the United States at different ages, we also exclude couples that wed outside the United States. These restrictions yield an analytical sample of 76,348 marriages, of which 67,068 are endogamous unions and 9,280 are intermarriages.⁴

Table 1 shows the distribution of education, nativity status, and age at migration disaggregated by wives and husbands’ pan-ethnic group. Mirroring recent immigration trends and general population characteristics, higher shares of Asians and Hispanics are foreign-born relative to their White and Black counterparts (Frey 2015; Waters and Gerstein Pineau 2015). For example, 5 percent of White and 14 percent of Black wives are foreign-born versus 46 and 77 percent of Hispanic and Asian wives, respectively. Compared with immigrants from Latin America, those from Asia arrive in the United States at older ages, on average. Seventy percent of Asian immigrant women arrived in the United States as adults, as compared with just under half of Hispanic immigrant women. Consistent with national trends, Asians average highest education levels and Hispanics the lowest levels.

The distribution of husband’s nativity status, age at migration, and education largely mirror the corresponding distributions for wives, save for two noteworthy exceptions. First, the nativity composition of Asian and Hispanic couples differs by sex in that lower shares of Hispanic women are foreign-born relative to Hispanic men: 46 versus 53 percent. The opposite pattern obtains for Asians: 77 percent of Asian women and 74 percent of Asian men are foreign-born. Second, except for Asian men, husbands are more educationally disadvantaged than their female counterparts. Specifically, 65 percent of Hispanic husbands had a high school education, as compared with 57 percent of Hispanic wives. Gender asymmetries in educational and nativity composition imply that availability of co-ethnic partners and consequently intermarriage rates will differ for men and women.

3.2. Variables

The empirical analysis of boundary crossing in sorting behavior considers four correlates of intermarriage: (1) Wife’s pan-ethnicity; (2) Husband’s pan-ethnicity; (3) Husband’s or Wife’s nativity status (or age at migration); and (4) Husband’s or Wife’s level of education.

Wife’s pan-ethnicity uses self-reported racial and ethnic identifiers to classify wives into four mutually exclusive pan-ethnic categories: NH White, NH Black, Hispanic; and NH Asian. *Husband’s pan-ethnicity* is constructed in an analogous fashion.

³As a robustness check, we re-estimated the log-linear models for marriages of 3 and 5 years duration. The pattern of variation in the permeability of the specific ethno-racial boundaries by age at migration differs across the subsamples that differ by duration, with the results for White-Black couples being most sensitive to marital duration. These differences reflect group disparities in union dissolution rates and underscore the importance of restricting the analyses to newlyweds in order to reduce selection bias.

⁴Sample size decreases by 2.9% with the exclusion of Native Americans and NH Others; 0.3% due to exclusion of spouses who married prior to migration; and 0.2% when cases reporting implausible dates of immigration are dropped. Appendix Table S1 reports the distribution of new marriages by husbands and wives’ pan-ethnicity.

Wife's nativity status distinguishes US-born female newlyweds from their peers who were born abroad and *husband's nativity status* does the same for male newlyweds. *Wife's age at migration* sorts female newlyweds into four groups based on their place of birth and timing of migration: (1) US-born; (2) migrants who arrived before age 12; (3) migrants who arrived between ages 12 and 17; and (4) migrants who arrived at ages 18 and over. We use age 12 as a cut-off between child and adolescent migrants based on past findings showing systematic differences in the socioeconomic outcomes of immigrants who arrived before and after age 12 (Rumbaut 2004; Myers et al. 2009).⁵ Age 18 is the legal age at marriage in most US states, and thus a justification for using it as the lower boundary for the age classification scheme.⁶ For ease of presentation, we designate spouses who entered the United States before age 12 as *child immigrants*; those who entered the United States between the ages of 12 and 17 as *adolescent immigrants*; and those who entered the United States after age 17 as *adult immigrants*. *Husband's age at migration* is constructed in an analogous fashion.

Wife's education is a categorical variable that classifies wives into three groups based on completed years of schooling: high school graduates or less, some college, and college graduates. *Husband's education* is constructed in an analogous fashion.

3.3. Analytical Plan

After describing intermarriage rates of White, Black, Hispanic, and Asian husbands and wives (Table 2), we construct a 96-cell contingency table by cross-classifying wife's pan-ethnicity by husband's pan-ethnicity, wife's nativity status, and wife's education ($4 \times 4 \times 2 \times 3$).⁷ Using the contingency table, we estimate crossing models, which are a version of the log-linear model that portrays differences in the relative permeability of specific boundaries according to specified covariates, namely wife's education and nativity status in our formulation. Crossing models are especially well suited to identify the relative ease of traversing specific ethno-racial boundaries, independent of differences in the marginal distribution of spouses' characteristics (Choi and Mare 2012; Mare 1991; Schwartz and Mare 2005). Importantly, log-linear models eliminate pan-ethnic differences in intermarriage propensities attributable to group size differences; this avoids understating intermarriage rates for big groups and overstating intermarriage propensities for small groups (Harris and Ono 2005).

The baseline model presents the relative difficulty of crossing a specific pan-ethnic boundary without regard to husband's nativity status or education. Subsequent models allow for variations across these dimensions. Formally, the baseline model is:

⁵Supplementary analyses reveal that intermarriage patterns also differ between immigrants that arrived before age 6 and between ages of 6 and 12; however, the ACS data does not contain sufficient cases to permit further age disaggregation. We distinguished between migrants who arrived before and after puberty because adolescence is the period of the life course when youth establish their social identities, including ethnicity; begin sexual maturation; and form romantic relationships (Carver et al. 2003; South et al. 2005). Additional sensitivity analyses using an alternate measure of age at migration (US-born, migration before age 6, 6–17, and 18+) yield similar conclusions, except that child migrants (i.e., those who migrated before 6) are considerably more likely than their peers who arrived at later ages to intermarry and variations in odds of boundary crossing between adolescent (i.e., those who migrated between ages 6–17) and child migrants are not as pronounced. The results from these analyses are available upon request.

⁶http://www.law.cornell.edu/wex/table_marriage

⁷Log-linear models, which rely on contingency tables that cross-classify all the covariates analyzed, yield estimates that are roughly equivalent to interaction terms among all the covariates considered in the analyses (Treiman 2009). Log-linear models, therefore, cannot accommodate a large number of covariates.

$$\log\left(\frac{n_{whne}}{t_{whne}}\right) = \lambda_w^W + \lambda_h^H + \lambda_n^N + \lambda_e^E + \lambda_{wh}^{WH} + \lambda_{wn}^{WN} + \lambda_{we}^{WE} + \lambda_{hn}^{HN} + \lambda_{he}^{HE} + \lambda_{ae}^{NE} + \lambda_{wne}^{WNE} + \lambda_{hne}^{HNE},$$

where W is wife's pan-ethnicity ($w=1, 2, 3, 4$); H is husband's pan-ethnicity ($h=1, 2, 3, 4$); N is wife's nativity status ($n=1, 2$); and E is wife's education level ($e=1, 2, 3$). The outcome n_{whne} is the expected number of new marriages between wives in pan-ethnic category w and husbands in pan-ethnic category h with wife's nativity status n , and wife's education e . To ensure that the estimates of marital sorting can be generalized to the US population, each model incorporates husband's weights using offset t_{whne} , which is equal to the inverse of the total weighted frequency of the cell divided by the unweighted cell count (Schwartz and Mare 2005).

The crossings model assumes the form:

$$\log(n_{whne}/t_{whne}) = \text{Baseline model} + \gamma_{whn}^{WHN} (+ \gamma_{whe}^{WHE})$$

where,

$$\gamma_{whn}^{WHN} = \begin{cases} \sum_{h \neq w} \gamma_{qn} \\ 0 \end{cases}$$

The parameter γ_{qn} reveals estimated differences in the difficulty of crossing pan-ethnic boundary q for spouses with wife's nativity status n ; γ_{whe}^{WHE} is defined analogously for wife's education e . We also conducted parallel analyses examining how the relative permeability of specific boundaries differs according to husband's nativity status n_H and husband's education e_H .

For the second part of the analysis, we construct a 192-cell contingency table by cross-classifying wife's pan-ethnicity by husband's pan-ethnicity, wife's age at migration, and wife's education ($4 \times 4 \times 4 \times 3$). Using this contingency table, the crossing models reveal how the relative permeability of specific boundaries differs by wife's education e and age at migration, a , rather than education e and nativity status n . Parallel analyses portray variations in the relative permeability of specific boundaries by husband's age at migration a_H and education e_H .

An additional analytical step that impacts all analyses warrants comment. That Black-Asian intermarriages are rare results in small cell sizes for this pairing. Because unions between Blacks and Asians are typically rare, even 8 waves of pooled ACS data yield insufficient numbers of new Black-Asian marriages for further disaggregation by education, nativity status, or age at migration. Thus, our log-linear models exclude interaction terms between

the Black-Asian boundary-crossing parameter and nativity, education, or age at migration. The ACS samples also yield insufficient numbers of new marriages between Hispanics and Asians for disaggregation by age at migration. Thus, the log-linear models also exclude interactions between the parameter to cross Hispanic-Asian boundaries and age at migration. Exclusion of interaction terms with the Hispanic-Asian and the Black-Asian crossing parameter avoids reliance on estimates based on tiny cell sizes while not altering the substantive findings. Appendix Table S2 presents the distribution of couples according to husband and wife's ethno-race, each spouse's nativity status, age at migration, and education.

RESULTS

Intermarriage Patterns by Pan-Ethnicity, Nativity Status, and Age at Migration

Table 2, which presents intermarriage rates for wives and husbands according to pan-ethnicity, nativity status, and age at migration, shows that minority men and women intermarry at higher rates than their White counterparts. For example, reflecting their ambivalence in the US racial hierarchy and smaller size, Hispanics are three times as likely as Whites to form exogamous unions. Gender asymmetries in intermarriage rates exist for Blacks and Asians, but not Hispanics and Whites (Wang et al. 2012). Black men are twice as likely as Black women to wed a non-Black spouse; however, Asian men are half as likely as Asian women to out-marry. Partly due to gender asymmetries in Black and Asian intermarriage patterns, exogamy levels are lower among Asian men compared with Black and Hispanic men, but they are higher among Asian women relative to Black and Hispanic women.⁸

Nativity-specific intermarriage rates reveal that US-born Hispanics and Asians, but not Whites and Blacks, intermarry at higher rates than their foreign-born peers. For example, 33 percent of US-born Hispanic women wed non-Hispanic husbands, as compared with 11 percent of foreign-born Hispanic women. Intermarriage rates are consistently higher among child migrants than their peers who migrated at older ages. For example, 46 percent of Asian women who migrated as children wed non-Asian spouses, as compared with 20 percent of their peers who migrated at older ages. Gender asymmetries exist in the pattern of variation in intermarriage rates by age at migration among migrants who arrived in the United States after childhood. Among women, the intermarriage rates of adolescent migrants are *largely* similar with those of female adult migrants in all ethno-racial groups. For example, 9 percent of White adolescent migrants out-married, as compared with 10 percent of their peers who arrived in the United States as adults. By contrast, among men, the pattern of variation in intermarriage rates by age at migration is not uniform across ethno-racial groups. Adolescent Black and Asian male migrants intermarry at higher rates than their peers who arrived at older ages; little differences exist in the intermarriage rates of adolescent and adult Hispanic male migrants; and intermarriage rates of White adolescent migrants are lower than those of White adult migrants.

⁸Appendix Table S3 reports the distribution of key covariates.

These aggregate patterns partly reflect constraints on partner choice due to differences in the availability of never married men and women in each pan-ethnic group. To take account of variations in relative group size, we estimate crossing models that reveal the odds of traversing specific pan-ethnic boundaries by education and age at migration after controlling for group size differentials. The crossing parameters capture differences in dispositions to out-marry and structural opportunities to interact with members of other groups that are independent of group size differences (Harris and Ono 2005).

Fit statistics

Table 3 presents the model fit statistics for several log-linear model specifications, including both likelihood ratios (G^2) and Bayesian information criterion (BIC) statistics. Given the large sample size, we rely on BIC statistics to select the best-fitting model, with more negative BIC statistics indicating a better fitting model (Raftery 1995).⁹ Panel A presents the results for models examining variations in intermarriage patterns according to husband's characteristics. Model 1 assumes that the odds of crossing pan-ethnic boundaries do not vary according to husband's nativity status or education. The positive BIC statistic, which signifies that the saturated model fits the data better than Model 1, indicates that by themselves the crossing parameters are insufficient to adequately describe intermarriage behavior.

Models 2 and 3 each add a two-way interaction term between the crossings parameter and husband's nativity status (N) or education (E). The two-way interaction terms between the crossing parameters and nativity (XN) improve model fit, as does the two-way interaction term between the crossing parameters and education (XE). Of the two, XN improves model fit slightly more than XE. Model 4, which includes both XN and XE, fits the data better than prior models. Model 5, which adds the three-way interaction between the crossing parameters, education and nativity status (XEN) to Model 4, yields a worse fit to the data. Substantively, this reveals that husband's nativity status and education *independently* influence immigrant men's mate selection behavior. Nativity status and education, however, do not *interact* with each other to shape men's propensity to intermarry. That is, nativity variations in men's intermarriage behavior do not differ by education. Results for husbands largely parallel those for wives.

Panel B presents the fit statistics for models examining variations in the relative permeability of specific pan-ethnic boundaries according to each spouse's age at migration and education. Fit statistics for these models are similar to those for log-linear models comparing the relative permeability of ethno-racial boundaries according to spouses' nativity status and education. The only exception to this overall pattern is observed in the fact that the two-way interaction between the crossing parameter and men's education (XE) improves model fit more than the two-way interaction between the crossing parameter and men's age at migration (XA). Nonetheless, here too, Model 4, which includes both the two-way interaction term between crossing parameter and education (XE) and the interaction term

⁹Reported likelihood ratios yield the same conclusions as those based on the BIC statistics.

between the crossing parameters and age at migration (XA), provides the best fit to the data for both samples.

Log-linear Results: Odds of Crossing Racial and Ethnic Boundaries by Nativity Status¹⁰

Using parameter estimates derived from the best-fitting model, the left panel of Table 4 presents the odds of crossing specific pan-ethnic boundaries according to nativity status and education for newlywed women. Recall that the best-fitting model includes both two-way interactions (XE and XN), but not the three-way interaction between the crossings parameter, education, and nativity status (XEN). Five noteworthy patterns emerge from the log-linear analyses that are pertinent to our interest in the permeability of ethno-racial boundaries in intermarriage and specifically how educational attainment and nativity status potentially soften these boundaries.

First, consistent with prior evidence, US natives are more likely than their foreign-born counterparts to cross ethno-racial boundaries in marriage (Qian and Lichter 2007). The odds of crossing the Black-Hispanic boundary, for example, are 60 percent higher among native-born women compared with similarly educated immigrants: $[100*(.40-.25)/.25=60]$. Arguably, ethno-racial boundaries are more permeable for US natives than the foreign-born, partly because the former are better integrated in American institutions, have more opportunities to interact with members of other groups as social equals, and share cultural traits with other US-born (Kalmijn 1998; Qian and Lichter 2007). The notable exception to this generalization obtains for the White-Black boundary, which, partly owing to the legacy of US anti-miscegenation laws (Kalmijn 1998), is *less* permeable for natives than immigrants. The odds of crossing the White-Black boundary are 31 percent higher among foreign-born men compared with their similarly educated US-born compatriots [e.g., $100*(.51-.39)/.39=31$]. Because immigrants' partner preferences also are influenced by origin country norms, resistance to marriages involving White-Black spouses is likely weaker among foreign-born compared with US-born men (Telles and Sue 2009).

Second, boundaries involving Whites are more permeable than those involving two nonwhite spouses. For example, among US-born female college graduates, the odds of traversing the White-Hispanic boundary in first marriage are three times the corresponding odds for the Black-Hispanic boundary $[0.207/0.061\approx 3]$. This result supports claims by Bany et al. (2014) and Johnson et al. (1997), among others, that Whites are the most desirable out-group partners.

Third, intermarriages are more common among Hispanics compared with Asians and Blacks. For example, among US-born female without a college education, the odds of crossing the White-Hispanic boundary in first marriages are 1.6 times the odds of crossing the White-Asian boundary and 3.1 times the odds of crossing the White-Black boundary: $[0.121/0.75\approx 1.6; 0.121/0.039\approx 3.1]$. The high permeability of boundaries involving Hispanics compared with Asians and Blacks attests both to the interstitial location of Hispanics on the US ethno-racial spectrum (Tienda and Mitchell 2006) and to the less sharply defined racial boundaries in Latin American source countries compared with the United States (Telles and Sue 2009).

Fourth, *within* education levels, boundaries involving Blacks are typically the most rigid. Among native-born women with some college education, for instance, the odds of crossing the White-Black boundary are 78 percent lower than the odds of crossing the White-Hispanic boundary: $[100 \times (0.037 - 0.167) / 0.167 \approx -78]$. This result further supports claims that Blacks are the least desirable out-group partners (Bany et al. 2014; Johnson et al. 1997; Wang et al. 2012).

Fifth, highly educated women with higher levels of education are more likely than their peers with lower educational attainment to intermarry (Qian and Lichter 2007). To illustrate, the odds of foreign-born women crossing the White-Hispanic boundary are 72 percent higher for college graduates compared with high school-educated immigrants: $[100 \times (0.134 - 0.078) / 0.078 \approx 72]$.¹¹ The positive educational gradient in intermarriage likely reflects educationally advantaged men and women's greater exposure to members of other groups in school, work, and residential settings (Qian and Lichter 2007). The notable exception to this generalization obtains for the White-Black boundary, where the educational gradient of intermarriage is non-existent (Choi and Tienda 2016). This finding further attests to the strong aversion towards White-Black unions in the United States. College-educated singles largely avoid crossing the White-Black boundary in marriage, particularly in comparison with other pan-ethnic boundaries, even when they have more opportunities to interact with one another.

The right panel in Table 4, which summarizes the relative permeability of specific boundaries according to husband's nativity status and education, parallel those based on wife's characteristics. US-born men are more likely than foreign-born peers to cross all boundaries. Positive education gradient in intermarriage also exists for men. Exception to this overall pattern are also observed in the crossing of the White-Black boundary in first marriage.

Log-linear Results: Odds of Crossing Racial and Ethnic Boundaries by Age at Migration

Table 5 presents the results from log-linear models estimating the relative permeability of crossing racial and ethnic boundaries according to wife's age at migration and education. In the interest of parsimony, our discussion focuses on the intermarriage patterns according to age at migration. Demarcating differences in the pattern of variation in intermarriage odds by age at migration are observed between boundaries involving Whites and those involving only minorities. The odds of crossing boundaries between Whites and non-Whites follows the non-linear pattern predicted by the life course paradigm and child development literature: intermarriage odds are highest among child migrants and lowest among adolescent migrants. Child migrants are considerably more likely than adolescent and adult migrants to intermarry a White spouse. For example, the odds that child migrants cross the White-Asian boundary are 5.9 times the corresponding odds for comparably-educated adolescent migrants. In part, this pattern emerges because child migrants are exposed to the English language during the critical period of language acquisition and gain near-native fluency (Bleakley and Chin 2010; Duncan and Trejo 2007; Knudson et al. 2006; Stevens and Swicegood 1987). Further bolstering the propensity of child migrants to intermarry is their early socialization in American institutions compared with their later arriving compatriots,

which allows them to acquire world views and tastes similar to their native-born peers (Beck et al. 2012; Myers et al. 2009; Goldberg et al. 2016; Rumbaut 2004). Their linguistic advantage, coupled with earlier socialization in US institutions, promotes their socioeconomic integration in the US society through adulthood and results in higher intermarriages with Whites.

By contrast, adolescent migrants are considerably less likely than child and adult migrants to intermarry. For example, the odds that adult migrants cross the White-Asian boundary are 3.6 times the corresponding odds for comparably-educated adolescent migrants. The relatively low intermarriage rates of teenage migrants suggest that social disruptions associated with a move during adolescence dampen their long-term socioeconomic integration and propensity to marry members of the mainstream group. Lower intermarriage odds among adolescent relative to adult migrants support claims that the adverse impact of migration-related disruptions during adolescence outweighs the integration benefits of prolonged exposure to the host country stemming from migration during adolescence instead of adulthood.

All odds ratios reported in Table 5 are statistically significant except for those corresponding to differences between (1) female adolescent and adult migrants' odds of crossing the White-Hispanic boundary, (2) male adolescent and adult migrant's odds of crossing the White-Asian boundary, and (3) the odds of crossing the White-Black boundary for those with varying levels of education.¹² Differences between the mate selection behavior of female Hispanic adolescent and adult migrants are not significant. This finding partly reflects the fact that mass influx of male migrants from Latin America replenishes the pool of co-ethnic partners for Hispanic immigrant women (Lichter et al. 2007). Having spent their formative years in the region of origin, adult migrants may share stronger cultural affinities with recent migrants compared with their peers who migrated during adolescence. Thus, it appears that female adult migrants have more opportunities and less constraints than foreign-born women who immigrated as adolescents to actualize their preferences for endogamy by marrying a recent co-ethnic immigrant. Greater availability of co-ethnic spouses will depress White intermarriage rates for Hispanic adult migrants to a greater extent than they do those of adolescent migrants, reducing the salience of differences in intermarriage prospects between them.

Unlike the boundary crossings that involve Whites, the odds of crossing the Black-Hispanic boundary decrease monotonically with rising age at migration; this pattern conforms with the standard predictions of assimilation theory. For example, the odds that child migrants cross the Black-Hispanic boundary are two times the corresponding odds for comparably educated adolescent migrants and three times the corresponding odds for comparably educated adult migrants. This pattern reflects the fact that most Black-Hispanic marriages involve US-born Blacks and foreign-born Black Hispanics (Qian and Cobas 2005). Black Hispanic immigrants who arrived at younger ages frequently encounter situation where others perceive and treat them as Blacks (Frank et al. 2010; Itzigsohn et al., 2004) and grow up in proximity to non-Hispanic Blacks (Massey and Denton 1989). These experiences increase the likelihood that foreign-born Black Hispanics- especially those exposed to the U.S. racial classification during their formative years- identify more closely with non-

Hispanic Blacks, rendering the Black-Hispanic boundary more permeable for immigrants who arrived at younger ages.

There are few gender asymmetries in the pattern of variation in intermarriage behavior by age at migration. Observed differences reflect variations in the magnitude and statistical significance of the coefficients. Differences in the odds of crossing the White-Hispanic boundary between adolescent and adult immigrant men are more salient than the corresponding differences for their female peers. Specifically, among male immigrants, the odds of crossing the White-Hispanic boundary are 10 percent lower among adolescent immigrants compared to their adult immigrant peers. This contrast with the fact that no significant differences in the odds of crossing the White-Hispanic boundary between adolescent and adult immigrant women. This gender asymmetry emerges partly because men are overrepresented in the immigrant flows from Latin America. Hispanic male immigrant's pool of co-ethnic spouses, especially those of adult male migrants, is replenished to a lesser extent than that of women (Lichter et al. 2007). Thus, differences in the odds of crossing the White-Hispanic boundary are more salient for Hispanic men who migrated during adolescence and adulthood than they are for their female peers.

In addition, differences in odds of crossing the White-Asian boundaries between adolescent and adult immigrant men are not statistically significant; however, the odds that female adolescent migrants cross the White-Asian boundary are substantially lower than the corresponding odds for female adult migrants. Asian men who arrived as adults are more likely than their peers who arrived at younger ages to subscribe to patriarchal Asian norms about gender relations and culturally acceptable household division of labor (Espiritu 2008). The patriarchal disposition of adult Asian male migrants likely deters both their willingness and ability to wed US-born White women, who typically subscribe to more gender egalitarian ideals (Espiritu 2008). Predispositions to forego the crossing of the White-Asian boundary in partner selection depress the prevalence of White intermarriage rates of male Asian adult migrants and diminish variation in intermarriage odds between male Asian adolescent and adult immigrants.

CONCLUSIONS

Intermarriage rates of the foreign-born population are a barometer of integration (Waters and Gerstein-Pineau 2015). Surprisingly, research about the mate selection immigrants largely ignores the implication of age at migration for intermarriage, despite growing evidence that the lifecycle timing of moves is consequential for immigrant integration (Clarke 2016; Goldberg et al. 2016). Our study, which explicitly investigates differences in the intermarriage propensities of child, adolescent, and adult migrants, illustrates the importance of lifecycle timing of migration for marital sorting behavior. It also broadens the focus of boundary crossing in partner selection by considering how age at migration influences marriages between racial and ethnic minorities as well as those with White spouses. This is an important consideration because contemporary immigrant integration occurs in the context of an increasingly diverse society.

By comparing the mate choices of adult migrants who married in the United States with those of child and adolescent migrants, we show how the lifecycle timing of migration is associated with the likelihood of crossing specific ethno-racial boundaries in marriage. Consistent with expectations in *Hypothesis 2*, our results reveal that the pattern of variation in intermarriage prospects by age at migration differs across boundaries. Specifically, demarcating differences in the pattern of variation in intermarriage behavior by age at migration exist between boundaries involving Whites and those involving only minorities. This finding highlights the value of considering the permeability of multiple ethno-racial boundaries in marriages for understanding immigrant integration in the context of a multi-ethnic society.

Support for the predictions based on the life course paradigm is found in the non-linear relationship between age at migration and intermarriage odds between Whites and non-Whites. The odds of crossing boundaries involving White spouses are highest among child migrants and lowest among adolescent migrants (*Hypothesis 1B*). Given that intermarriages with the mainstream group (i.e., Whites) serve as proof of immigrant integration (Waters and Gerstein Pineau 2015), this finding suggest that migrating during childhood improves immigrants' long-term integration prospects into the mainstream society. This pattern likely reflects both child migrant's earlier and prolonged exposure to American institutions as well as their greater mastery of the English language due to their arrival in the United States during the critical period of language acquisition (Bleakly and Chin 2008, 2010; Rumbaut 2004; Duncan and Trejo 2007). By contrast, boundary crossing in marriage occurs less frequently among adolescent migrants relative to their peers who moved at earlier or later life course stages, which affirms the claims of the child development literature that immigration-related disruptions during adolescence are particularly detrimental for long-term integration prospects including their adult partnering behavior (Myers 1999; South et al. 2005).

Unlike intermarriages involving White spouses, immigrants who arrive at older ages have lower odds of crossing the Black-Hispanic boundary in marriage. This finding, which is consistent with hypothesis based on insights from the migration literature (*Hypothesis 1A*), likely reflects the fact that Black-Hispanic intermarriages typically occur between US-born, non-Hispanic Blacks and foreign-born Black Hispanics (Qian and Cobas 2005). Black Hispanic immigrants frequently encounter situation where others perceive and treat them as non-Hispanic Blacks (Frank et al. 2010; Itzigsohn et al., 2004) and grow up in proximity to non-Hispanic Blacks (Massey and Denton 1989). Earlier exposure to US racial divisions increases the likelihood that foreign-born Black Hispanics share experiences and identify more closely with NH Blacks, increasingly the likelihood that Black Hispanics marry NH Blacks.

Finally, with few exceptions, we find little evidence of gender asymmetries in the overall association between intermarriage and the lifecycle timing of migration. The main differences involve the magnitude and statistical significance of the odds ratios. Specifically, differences in odds of crossing the White-Hispanic boundary between adolescent and adult migrants are less salient for women than for men. This asymmetry is likely due to the replenishment of co-ethnic partners via high levels of male immigration from Latin America

that enhance adult Hispanic immigrant women's ability to actualize their preferences for endogamy. By contrast, differences between adolescent and adult migrants in odds of crossing the White-Asian boundary are less salient for men than for women. This gender asymmetry partly reflects the fact that Asian men who immigrated as adults are more likely than their peers who arrived during adolescence to subscribe to patriarchal norms about household division of labor (Espiritu 2008). Thus, they may be less willing and less able than Asian men who arrived during adolescence to marry US-born Whites, who subscribe to gender egalitarian norms about household division of labor. Differences in the odds of crossing the White-Asian boundary are, therefore, less salient between Asian male adolescent and adult migrants than they are between their female counterparts.

Like all empirical work, our study has limitations. Although gender asymmetries in intermarriage patterns are well established (Wang et al. 2012), sample size constraints (even pooling seven years of the ACS) preclude analyses of pan-ethnic boundaries that *jointly* represent wife and husband's pan-ethnic membership. Reported analyses distinguish White-Hispanic boundaries from White-Asian boundaries, but cannot differentiate between the odds of crossing boundaries involving White husbands and Asian wives and the corresponding odds involving White wives and Asian husbands. Moreover, despite claims that wife and husband's nativity status *jointly* shape intermarriage patterns, sample size constraints prevent comparisons of intermarriage patterns according to husband and wife's *joint* migration experiences (e.g., Choi et al. 2012; Fu 2010). Therefore, we conduct separate analyses documenting variations in mate selection behavior separately according to husband's characteristics and wife's characteristics. Sample sizes permitting, future studies will add value by adopting a two-sex perspective in order to empirically evaluate how husband and wife's characteristics *interact* to jointly shape the permeability of pan-ethnic boundaries. Additionally, following conventions in the intermarriage literature, we consider Hispanics and Asians as members of mutually exclusive pan-ethnic groups. An early study by Rosenfeld (2001) claims that the prevalence of intermarriage between Hispanic and Asian subgroups is sufficiently high to render pan-ethnic boundaries salient barriers to marriage in the United States. Nevertheless, given the prominence of these regions in driving contemporary US immigration, subject to securing adequate sample sizes, future work should further consider whether specific national origin groups are more or less likely to cross nationality boundaries in intermarriage (Landale and Oropesa 2007).

These limitations notwithstanding, our study reveals that in addition to birthplace, the lifecycle timing of international migration is associated with integration prospects indexed by intermarriage behavior. Moving during the two critical periods – childhood and adolescence – shapes immigrant's prospects for integration into the mainstream society. Migrating during childhood typically leads to more successful integration outcomes into the mainstream society by facilitating their mastery of the English language, which is crucial for achieving contingent milestones in education and in the labor market as a prelude to intergroup relations leading to marriage. Migrating during adolescence, however, poses unique social integration challenges that may outweigh the influences of earlier exposure to English and US culture in fostering long-term integration. Adolescent migrant's lower prospects for intermarriage is but one symptom of thwarted integration, but one that immigrant families and policymakers should carefully monitor, particularly in its association

with low socioeconomic attainments and the timing of other life events associated with immigrant's long-term wellbeing. Our results also suggest that earlier socialization to the host country norms increases the likelihood that immigrants move away from the origin country norms and adopt the cultural repertoires of the host country. This is evinced by the fact that immigrants who arrived at earlier ages are more likely than their peers who arrived at older ages to cross the Black-Hispanic boundary.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

- Adsera A, Ferrer A, Sigle-Rushton W, Wilson B. 2012; Fertility Patterns of Child Migrants: Age at Migration and Ancestry in Comparative Perspective. *Annals of the American Academy of Political and Social Science*. 643(160):160–189. DOI: 10.1177/0002716212444706
- Alba RD, Nee V. 1997; Rethinking Assimilation Theory for a New Era of Immigration. *International Migration Review*. 31(4):826–874. [PubMed: 12293207]
- Alba, RD, Nee, V. *Remaking the American Mainstream: Assimilation and Contemporary Immigration*. Vol. 2003. Cambridge, MA: Harvard University Press; 1997.
- Anderson S, Leventhal T, Dupéré V. 2014; Residential Mobility And The Family Context: A Developmental Approach. *Journal of Applied Developmental Psychology*. 35(2):70–78.
- Balistreri KS, Joyner K, Kao G. 2015; Relationship Involvement Among Young Adults: Are Asian American Men an Exceptional Case? *Population Research and Policy Review*. 34(5):709–732. [PubMed: 26549919]
- Bany JA, Robnett B, Feliciano C. 2014; Gendered Black Exclusion: The Persistence of Racial Stereotypes Among Daters. *Race and Social Problems*. 6(3):201–213.
- Beck AN, Corak M, Tienda M. 2012; Age at Immigration, Social Boundaries and the Adult Attainments of Child Migrants. *Annals of the American Academy of Political and Social Science*. 643:134–159. [PubMed: 23105147]
- Blackwell D, Lichter D. 2000; Mate Selection Among Married And Cohabiting Couples. *Journal of Family Issues*. 21(3):275–302.
- Bleakley H, Chin A. 2008; What Holds Back the Second Generation? The Intergenerational Transmission of Language Human Capital among Immigrants. *The Journal of Human Resources*. 43(2):267–298. [PubMed: 18584062]
- Bleakley H, Chin A. 2010; Age at Arrival, English Proficiency, and Social Assimilation Among US Immigrants. *American Economic Journal of Applied Economics*. 2(1):165–192.
- Carver, K, Joyne, K, Udry, RJ. National Estimates of Adolescent Romantic Relationships. In: Florsheim, P, editor. *Adolescent Romantic Relations and Sexual Behavior: Theory, Research, and Practical Implications*. Mahwah, NJ: Lawrence Erlbaum Associates; 2003. 23–56.
- Choi KH, Mare RD. 2012; International Migration and Educational Assortative Mating in Mexico and the United States. *Demography*. 49(2):449–476. [PubMed: 22419447]
- Choi KH, Tienda M. 2016; Marriage Markets and Mate Selection: Bringing Marriage Markets Back. *Journal of Marriage and Family*. doi: 10.1111/jomf.12346
- Clarke, Andrew. 2016; Age at Immigration and the Educational Attainment of Foreign-born Children in the United States: The Confounding Effects of Parental Education. *International Migration Review*. doi: 10.1111/imre.12294
- Collins, PH. *Black Sexual Politics: African Americans, Gender, And The New Racism*. New York: Routledge; 2004.
- Corak, M. Age at Immigration and the Education Outcomes of Children. In: Masten, A, Hernandez, D, Liebkind, K, editors. *Realizing the Potential of Immigrant Youth*. Cambridge: Cambridge University Press; 2012. 90–114.

- Duncan, B, Trejo, SJ. Ethnic Identification, Intermarriage, and Unmeasured Progress by Mexican Americans. In: Borjas, GJ, editor. Mexican Immigration to the United States. Chicago, IL: University of Chicago Press; 2007. 229–268.
- Elder GH. 1998; The Life Course as Developmental Theory. *Child Development*. 69(1):1–12. [PubMed: 9499552]
- Espiritu, Y. Asian American Women and Men: Labor, Law, and Love. Lanham: Rowman & Littlefield Publishers, Inc; 2008.
- Frank R, Akresh I, Lu B. 2010; Latino Immigrants and the U.S. Racial Order: How and Where Do They Fit In? *American Sociological Review*. 75(3):378–401.
- Frey, WH. Diversity Explosion: How New Racial Demographics are Remaking America. Washington, DC: Brookings Institution Press; 2015.
- Fu VK. 2001; Racial Intermarriage Pairings. *Demography*. 38(2):147–159. [PubMed: 11392904]
- Fu VK. 2010; Remarriage, Delayed Marriage, and Black/White Intermarriage, 1968–1995. *Population Research and Policy Review*. 29:689–713.
- Gans HJ. 1997; Toward a Reconciliation of "Assimilation" and "Pluralism": The Interplay of Acculturation and Ethnic Retention. *International Migration Review*. 31(4):875–892. [PubMed: 12293208]
- Goldberg, RE; Tienda, M; Adsera, A. Age at migration, Family Instability, and Timing of Sexual Onset. *Social Science Research*. 2016. (online first). Accessed January 1, 2017.
- Gonzalez A. 2003; The education and wages of immigrant children: the impact of age at arrival. *Economics of Education Review*. 22:203–212.
- Gordon, M. The Nature of Assimilation. In: Gordon, MM, editor. *Assimilation in American life: The Role of Race, Religion, and National Origins*. New York: Oxford University Press; 1964.
- Harris KM, Duncan GJ, Boisjoly J. 2002; Evaluating the Role of "Nothing to Lose" Attitudes on Risky Behavior in Adolescence. *Social Forces*. 80(3):1005–1039.
- Harris DR, Ono H. 2005; How Many Interracial Marriages Would There be if all Groups were of Equal Size in all Places? A New Look at National Estimates of Interracial Marriage. *Social Science Research*. 34(1):236–251.
- Herman M, Campbell M. 2012; I Wouldn't, But You Can: Attitudes Toward Interracial Relationships. *Social Science Research*. 41(2):343–358. [PubMed: 23017756]
- Hoffmann JP, Johnson RA. 1998; A National Portrait of Family Structure and Adolescent Drug Use. *Journal of Marriage and Family*. 60(3):633–645.
- Iztigsohn, Jose; Silvia, Giorguli; Obed, Vazquez. 2004; Immigrant Incorporation and Racial Identity: Racial Self-Identification among Dominican Immigrants. *Ethnic and Racial Studies*. 28(1):50–78.
- Johnson JH, Farrell WC, Guinn C. 1997; Immigration Reform and the Browning of America: Tensions, Conflicts and Community Instability in Metropolitan Los Angeles. *The International Migration Review*. 31(4):1055–1095.
- Kalmijn M. 1998; Intermarriage and homogamy: Causes, patterns, trends. *Annual Review of Sociology*. 24:395–421.
- Knudsen EI, Heckman JJ, Cameron JL, Shonkoff JP. 2006; Economic, Neurobiological, And Behavioral Perspectives On Building America's Future Workforce. *PNAS*. 103(27):10155–10162. [PubMed: 16801553]
- Landale NS, Oropesa RS. 2007; Hispanic Families: Stability and Change. *Annual Review Sociology*. 33:381–405.
- Larson R, Haam M. 1992; Storm and Stress" in Early Adolescence: The Relationship of Negative Events with Dysphoric Affect. *Developmental Psychology*. 29(1):130–140.
- Lee SM, Edmonston B. 2011; Age-at-Arrival's Effects on Asian Immigrants' Socioeconomic Outcomes in Canada and the US. *International Migration Review*. 45(3):527–561.
- Lichter, Daniel T; Brown, JB; Qian, Z; Carmalt, JH. 2007; Marital Assimilation Among Hispanics: Evidence of Declining Cultural and Economic Incorporation? *Social Science Quarterly*. 88(3): 745–765.
- Mare R. 1991; Five Decades of Educational Assortative Mating. *American Sociological Review*. 56(1): 15–32.

- McLanahan S. 2004; Diverging Destinies: How Children Are Faring Under The Second Demographic Transition. *Demography*. 41(4):607–627. [PubMed: 15622946]
- Meng X, Gregory R. 2005; Intermarriage and the Economic Assimilation of Immigrants. *Journal of Labor Economics*. 23(1):135–174.
- Min PG, Kim C. 2009; Patterns of Intermarriages and Cross-Generational In-Marriages among Native-Born Asian Americans. *International Migration Review*. 43(3):447–470.
- Myers D, Gao X, Emeka A. 2009; The Gradient of Immigrant Age at Arrival Effects on Socioeconomic Outcomes in the US. *International Migration Review*. 43(1):205–229.
- Myers SM. 1999; Childhood Migration and Social Integration in Adulthood. *Journal of Marriage and Family*. 61(3):774–789.
- Ocampo, AC. *The Latinos of Asia: How Filipino Americans Break the Rules of Race*. Stanford, California: Stanford University Press; 2016.
- Oropesa RS, Landale NS. 1997; In Search Of The New Second Generation: Alternative Strategies For Identifying Second Generation Children And Understanding Their Acquisition Of English. *Sociological Perspectives*. 40(3):429–455.
- Phinney JS. 1990; Ethnic Identity in Adolescents and Adults: Review of Research. *Psychological Bulletin*. 108(3):499–514. [PubMed: 2270238]
- Qian Z, Lichter DT. 2001; Measuring Marital Assimilation: Intermarriage Among Natives And Immigrants. *Social Science Research*. 30(2):289–312.
- Qian Z, Lichter DT. 2007; Social Boundaries and Marital Assimilation: Interpreting Trends in Racial and Ethnic Intermarriage. *American Sociological Review*. 72(1):68–94.
- Qian Z, Glick JE, Batson CD. 2012; Crossing boundaries: nativity, ethnicity, and mate selection. *Demography*. 49(2):651–675. [PubMed: 22350840]
- Raftery AE. 1995; Bayesian Model Selection in Social Research. *Sociological Methodology*. 25:111–163.
- Rodríguez-García D. 2015; Intermarriage and Integration Revisited: International Experiences and Cross- Disciplinary Approaches. *The Annals of the American Academy of Political and Social Science*. 662(1):8–36.
- Rosenfeld MJ. 2001; The Salience of Pan-National Hispanic and Asian Identities in US Marriage Markets. *Demography*. 38(2):161–175. [PubMed: 11392905]
- Ruiz, A; Zong, J; Batalova, J. Immigrant Women in the United States. Migration Information Source. 2015. <http://www.migrationpolicy.org/article/immigrant-women-united-states>
- Rumbaut RG. 2004; Ages, Life Stages, and Generational Cohorts: Decomposing the Immigrant First and Second Generations in the United States. *International Migration Review*. 38(3):1160–1205.
- Rumberger RW, Larson KA. 1998; Student Mobility and the Increased Risk of High School Dropout. *American Journal of Education*. 107(1):1–35. DOI: 10.1086/444201
- Schwartz CR. 2013; Trends and Variation in Assortative Mating: Causes and Consequences. *Annual Review of Sociology*. 39:451–470.
- Schwartz CR, Mare RD. 2005; Trends In Educational Assortative Marriage From 1940 To 2003. *Demography*. 42(4):621–646. [PubMed: 16463914]
- South SJ, Haynie DL, Bose S. 2005; Residential Mobility and the Onset of Adolescent Sexual Activity. *Journal of Marriage and Family*. 67(2):499–514.
- Stevens G, Swicegood G. 1987; The Linguistic Context of Ethnic Endogamy. *American Sociological Review*. 52(1):73–82.
- Telles E, Sue CA. 2009; Race Mixture: Boundary Crossing in Comparative Perspective. *Annual Review of Sociology*. 35(1):129–46.
- Tienda, M, Mitchell, F. *Multiple Origins, Uncertain Destinies: Hispanics and the American Future*. Washington D.C: National Academy Press; 2006.
- Teachman JD, Paasch K, Carver K. 1996; Social Capital and Dropping Out of School Early. *Journal of Marriage and Family*. 58(3):773–783.
- Teitler JO, Hutto N, Reichman NE. 2012; Birthweight Of Children Of Immigrants By Maternal Duration Of Residence In The United States. *Social Science & Medicine*. 75(3):459–468. [PubMed: 22580075]

- Treiman, D. Quantitative Analysis: Doing Research to Test Ideas. San Francisco: Jossey Bass; 2009.
- Wang W, Taylor P, Parker K, Passel JS, Patten E, Motel S. 2012The Rise of Inter-marriage: Rates, Characteristics Vary by Race and Gender. PEW Research.
- Waters, MC, Pineau, MG. The Integration Of Americans Into American Society. Washington, DC: National Academies of Sciences, Engineering, and Medicine; 2015.

Sample Characteristics (%)

Table 1

	Wife's characteristics				Husband's characteristics			
	NH White	NH Black	Hispanic	NH Asian	NH White	NH Black	Hispanic	NH Asian
Nativity status	53,909	4,892	12,093	5,454	53,998	5,693	12,109	4,548
% Foreign-born	5.1	14.0	46.4	77.1	5.4	15.0	52.9	74.4
Age at migration								
US-born	94.9	86.0	53.6	22.9	94.6	85.0	47.1	25.6
FB <12	1.5	2.7	13.2	14.6	1.6	2.9	12.4	14.2
FB 12–17	0.7	3.7	11.0	8.3	0.6	2.1	14.3	10.5
FB 18+	3.0	7.7	22.2	54.2	3.1	10.0	26.2	49.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education								
HS or less	25.5	37.6	56.5	16.1	34.0	49.1	64.7	17.8
Some college	27.2	34.4	24.7	15.7	26.0	29.6	21.0	15.0
BA or more	47.3	28.0	18.8	68.2	40.0	21.3	14.3	67.2
Total	100	100	100	100	100.0	100.0	100.0	100.0

Source: 2008–2015 American Community Surveys

Sample: First marriages formed within 12 months of the survey date

Notes: Column percentages are weighted.

Table 2

Intermarriage Rates for Female and Male Newlyweds

	Wife's characteristics				Husband's characteristics			
	NH White	NH Black	Hispanic	NH Asian	NH White	NH Black	Hispanic	NH Asian
All	53,909	4,892	12,093	5,454	53,998	5,693	12,109	4,548
Nativity								
US-born	8.2	9.6	32.9	45.2	8.0	22.2	35.0	32.3
Foreign-born	10.5	13.7	11.4	24.8	12.6	20.9	12.3	11.1
Age at migration								
FB, <12	13.2	23.4	17.1	45.7	11.2	32.1	19.7	28.2
FB, 12–17	8.6	11.9	8.8	19.9	10.3	25.6	10.0	11.1
FB, 18+	9.6	11.2	9.4	19.9	13.7	16.7	10.1	6.2
Education								
HS or less	9.8	8.8	12.7	28.9	7.6	18.8	15.4	13.9
Some college	8.7	10.1	29.9	37.7	8.1	23.0	31.2	24.4
BA or more	7.2	12.1	44.7	27.7	8.8	27.9	45.5	15.4

Source: 2008–2015 American Community Surveys

Sample: First marriages formed within 12 months of the survey date

Notes: Percentages are weighted. Counts are not weighted.

Table 3

Fit Statistics

		Wife's characteristic			Husband's characteristic		
		d.f.	G ²	BIC	d.f.	G ²	BIC
A. Nativity status							
Model							
1	Baseline + X	45	560	54	45	584	78
2	Model 1 + XE	35	303	-90	35	292	-101
3	Model 1 + XN	40	359	-91	40	331	-119
4	Model 1 + XE + XN	30	124	-213	30	53	-284
5	Model 1 + XE + XN + XEN	20	46	-178	20	31	-194
B. Age at migration							
Model							
1	Baseline + X	99	1171	58	99	1224	111
2	Model 1 + XE	89	880	-121	89	915	-86
3	Model 1 + XA	87	768	-210	87	1040	62
4	Model 1 + XE + XA	77	519	-347	77	710	-156
5	Model 1 + XE + XA + XEA	53	362	-234	53	645	49

Source: 2008–2015 American Community Surveys

Sample: First marriages formed within 12 months of the survey date

Notes: Best fitting model is boxed. The BIC statistics adjusts the likelihood-ratio test G^2 for sample size. $BIC = G^2 - d.f. * \log(N)$

Abbreviation X-Crossing parameter; N-nativity status; A-age at migration; and E-education.

Black-Asian marriage are very rare. Our models, therefore, do not examine how the relative permeability of the Black-Asian boundary varies according to each spouse's nativity status, age at migration, or education.

Hispanic-Asian marriage are rare. Our models, therefore, do not examine how the relative permeability of the Hispanic-Asian boundary varies according to each age at migration.

Table 4
Log-linear Models Estimating Odds of Boundary Crossing by Nativity status and Education

	Wife's characteristics				Husband's characteristics			
	White-Black	White-Hisp	White-Asian	Black-Hisp	Black-Asian	Hisp-Asian	White-Black	White-Hisp
HS or less								
USB	0.039	0.121	0.075	0.040	0.013	0.044	0.037	0.134
FB	0.051	0.078	0.066	0.025	–	0.016	0.045	0.096
Some college								
USB	0.037	0.167	0.078	0.053	–	0.071	0.041	0.168
FB	0.048	0.109	0.069	0.033	–	0.026	0.049	0.121
BA or more								
USB	0.037	0.207	0.101	0.061	–	0.081	0.038	0.226
FB	0.048	0.134	0.088	0.038	–	0.029	0.047	0.162

Source: 2008–2015 American Community Surveys

Sample: First marriages formed within 12 months of the survey date

Notes: Odds are estimated from best fitting model (Model 4).

Log-linear Models Estimating Odds of Boundary Crossing by Education and Age at Migration

Table 5

	Wife's characteristics						Husband's characteristics					
	White-Black	White-Hisp	White-Asian	Black-Hisp	Black-Asian	Hisp-Asian	White-Black	White-Hisp	White-Asian	Black-Hisp	Black-Asian	Hisp-Asian
HS or less												
US-born	0.038	0.121	0.071	0.039	0.007	0.022	0.037	0.133	0.045	0.038	0.003	0.018
FB, <12	0.073	0.107	0.094	0.040	—	—	0.047	0.114	0.053	0.037	—	—
FB, 12–17	0.003	0.062	0.016	0.020	—	—	0.011	0.082	0.025	0.019	—	—
FB, 18+	0.046	0.064	0.058	0.013	—	—	0.048	0.092	0.025	0.011	—	—
Some college												
US-born	0.037	0.165	0.069	0.052	—	0.038	0.039	0.167	0.086	0.060	—	0.046
FB, <12	0.070	0.146	0.091	0.054	—	—	0.051	0.143	0.101	0.058	—	—
FB, 12–17	0.002	0.084	0.015	0.026	—	—	0.012	0.103	0.047	0.030	—	—
FB, 18+	0.044	0.088	0.057	0.017	—	—	0.051	0.115	0.048	0.017	—	—
BA or more												
US-born	0.038	0.205	0.100	0.062	—	0.046	0.037	0.221	0.114	0.068	—	0.044
FB, <12	0.072	0.181	0.132	0.064	—	—	0.048	0.189	0.134	0.066	—	—
FB, 12–17	0.003	0.105	0.022	0.031	—	—	0.011	0.137	0.063	0.034	—	—
FB, 18+	0.045	0.109	0.082	0.021	—	—	0.048	0.152	0.063	0.020	—	—

Sample: First marriages formed within 12 months of the survey date

Notes: Odds are estimated from best fitting model (Model 4).